

## WHAT IS CLAIMED IS:

1. A light-emitting diode lighting circuit for activating a semiconductor switching device to illuminate at least one light-emitting diode, the light-emitting diode lighting circuit comprising:

a differential amplifier provided at a preceding stage of the semiconductor switching device;

a switch for inputting a supply voltage to a positive input side of the differential amplifier;

a reference resistor having one end connected to the positive input side of the differential amplifier, and the other end grounded; and

at least one voltage-dividing resistor connected to a negative input side of the differential amplifier for dividing the supply voltage,

wherein a resistance value  $R_{ref}$  of the reference resistor and a resistance value  $R1/R2$  of the voltage-dividing resistors are decided such that a relationship between a leakage resistance value  $R_s$  of the switch and both resistance values  $R_{ref}$  and  $R1/R2$  becomes  $R_s > (R1/R2) \times R_{ref}$ .

2. The light-emitting diode lighting circuit according to claim 1, wherein the light-emitting diode is a light for an in-vehicle lighting device, and the switch is for illuminating the lighting device.

3. The light-emitting diode lighting circuit according to claim 1, and further including an input protection resistor operative connected to an output side of the differential amplifier in series with said semiconductor switching device.

4. The light-emitting diode lighting circuit according to claim 1, and further including a resistor operatively connected to an output side of the differential amplifier in series with light-emitting diode lighting circuit.

5. The light-emitting diode lighting circuit according to claim 1, wherein the semiconductor switching device is a NPN transistor.

6. The light-emitting diode lighting circuit according to claim 1, wherein the leakage value of the switch is provided by a leakage resistor operative positioned in parallel with the switch.

7. The light-emitting diode lighting circuit according to claim 1, wherein the at least one voltage-dividing resistor includes two resistors operatively positioned in series with each other.

8. The light-emitting diode lighting circuit according to claim 7, wherein the negative input side of the differential amplifier is operatively connected between the two resistors.

9. The light-emitting diode lighting circuit according to claim 1, wherein the semiconductor switching device is operatively to a cathode side of the light-emitting diode lighting circuit.

10. The light-emitting diode lighting circuit according to claim 1, wherein a voltage of the negative input side of the differential amplifier is within a range of  $1/10$  and  $1/20$  of a supply voltage.

11. A light-emitting diode lighting circuit comprising:  
at least one light-emitting diode;  
a semiconductor switching device for activating the at least one light-emitting diode to illuminate the light-emitting diode lighting circuit;  
a differential amplifier operative connected between the semiconductor switching device and the at least one light-emitting diode;  
a switch operatively connected to a positive input side of the differential amplifier;  
a reference resistor having a first end connected to the positive input side of the differential amplifier, and the a second end grounded; and  
at least one voltage-dividing resistor connected to a negative input side of the differential amplifier,  
wherein a leakage resistance value  $R_s$  of the switch is greater than the resistance value  $R_{ref}$  of the reference resistor times a resistance value of the voltage-dividing resistor.

12. The light-emitting diode lighting circuit according to claim 11, wherein the light-emitting diode is a light for an in-vehicle lighting device, and the switch is for illuminating the lighting device.

13. The light-emitting diode lighting circuit according to claim 11, and further including an input protection resistor operative connected to an output side of the differential amplifier in series with said semiconductor switching device.

14. The light-emitting diode lighting circuit according to claim 11, and further including a resistor operatively connected to an output side of the differential

amplifier in series with light-emitting diode lighting circuit.

15. The light-emitting diode lighting circuit according to claim 11, wherein the semiconductor switching device is a NPN transistor.

16. The light-emitting diode lighting circuit according to claim 11, wherein the leakage value of the switch is provided by a leakage resistor operative positioned in parallel with the switch.

17. The light-emitting diode lighting circuit according to claim 11, wherein the at least one voltage-dividing resistor includes two resistors operatively positioned in series with each other.

18. The light-emitting diode lighting circuit according to claim 17, wherein the negative input side of the differential amplifier is operatively connected between the two resistors R1, R2 and the relationship between the leakage resistance value of the switch and both the resistance values Rref and R1/R2 becomes  $R_s > (R1/R2) \times R_{ref}$ .

19. The light-emitting diode lighting circuit according to claim 11, wherein the semiconductor switching device is operatively to a cathode side of the light-emitting diode lighting circuit.

20. The light-emitting diode lighting circuit according to claim 11, wherein a voltage of the negative input side of the differential amplifier is within a range of 1/10 and 1/20 of a supply voltage.